

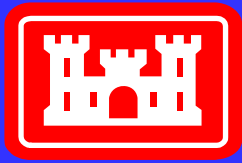
Wilmington District



WILMINGTON HARBOR DREDGED MATERIAL MANAGEMENT PLAN (DMMP)



<http://www.saw.usace.army.mil/wilmington-harbor/main.htm>

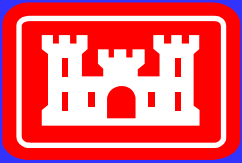


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Wilmington Harbor DMMP IPR Presentation Topics



- DMMP Process
- Project Location & Existing Conditions
- All Alternatives Considered
- Alternatives Eliminated
- Remaining Alternatives
- Environmental Considerations
- Economic Summary
- Summary of Recommended Plan
- Policy Issues
- Next Actions by PDT
- DMMP Schedule



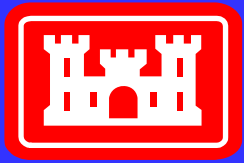
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DMMP Process

- Preliminary Assessment
 - Completed in 1996
 - Identify investigations to document long-term management plan
- Phase I – DMMP
 - O&M for 38 ft project
 - Completed in 1997
- Phase II – DMMP
 - Upper Harbor (Anchorage Basin & NECFR)
 - O&M (38' and 42') and new work
 - Disposal in Eagle Island and improvements
 - Completed in 2001
- Phase III – Comprehensive DMMP, part of Wilmington Harbor '96 Act project (42 ft project)
 - To meet requirements of ER 1105-2-100 and PGL-47
 - 20 year dredging requirement (2011 – 2031)
 - Environmentally acceptable , engineeringly sound and economically justified
 - Dredging needs, disposal capabilities, DA capacities, environmental compliance, beneficial use, & continued economic justification
 - Initiated in 2004

Iterative Process



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DMMP Phase III Process



- Multi-disciplined PDT including: non-Fed sponsors, Corps team members, resource agencies, stakeholders
- DMMP alternatives identified, evaluated, screened and recommended/eliminated
- 29 potential alternatives originally identified
- Eliminated 15 due to significant environmental impacts, mitigation costs, lack of available land, potential groundwater impacts, lack of economic justification
- Remaining 14 include modification to existing sites, rehab/restore disposal islands, acquisition of new sites, and beneficial uses

Existing Conditions

Wilmington Harbor



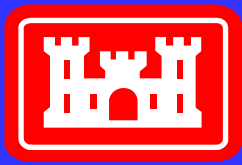
US Army Corps of Engineers
Wilmington District



Outer Ocean Bar

Inner Ocean Bar





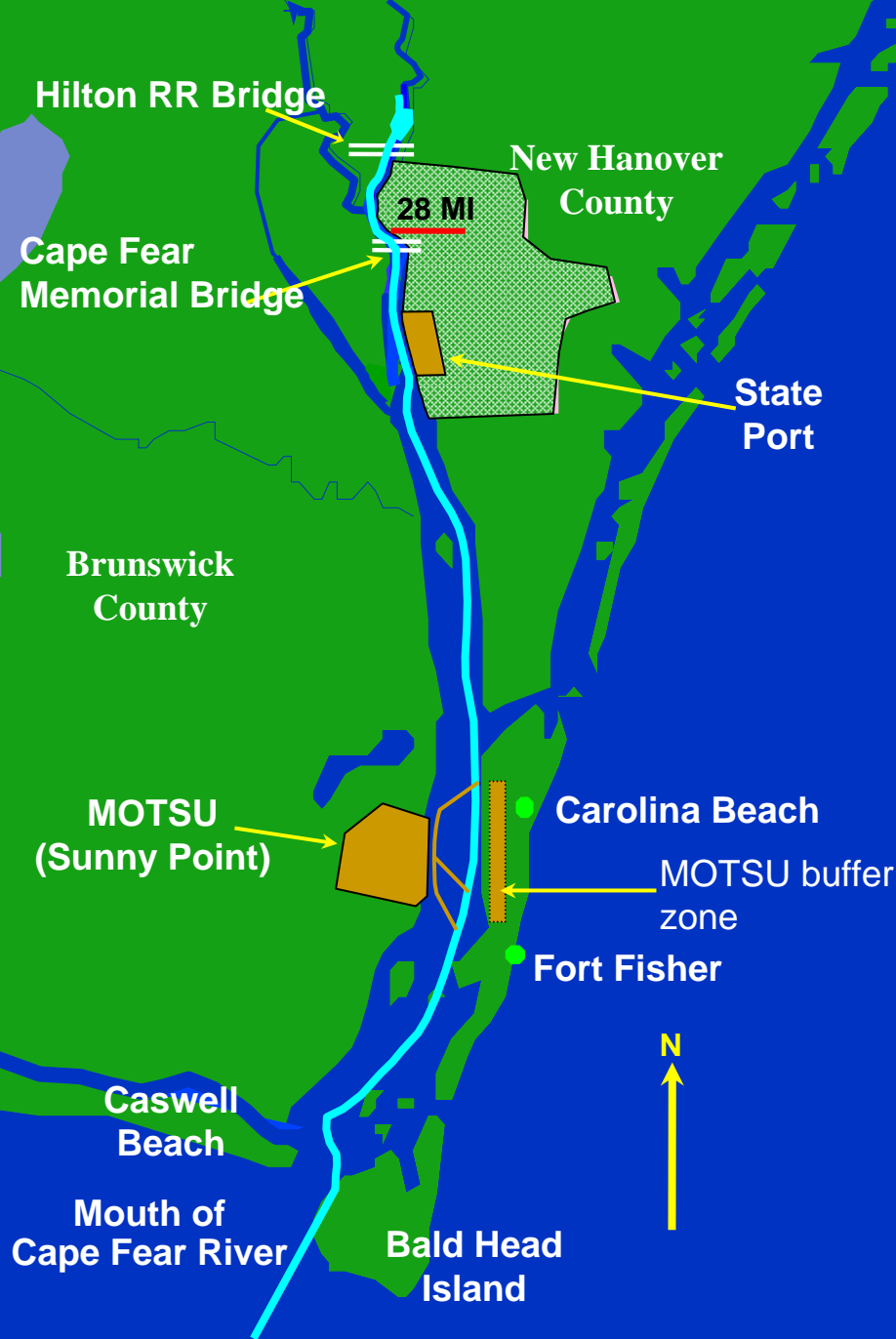
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Existing Conditions

		Shoaling Cubic	Frequency of			Sediment Type
Reaches	Channel Reaches	Yards per Year	dredging (years)	Disposal Location	Dredge Type	
	Upstream Limits of Project to 750 ft					
Upper	above Chemserve	12,600	5	Eagle Island Cells 2/3	pipeline	silt
Upper	750 ft above Chemserve to NC 133 Bridge	70,600	5	EI Cell 2/Cell 3	pipeline	silt
Upper	NC 133 Bridge to Cape Fear Mem Bridge	14,100	5	EI Cell 2/Cell 3	pipeline	silt
Upper	Anchorage Basin	1,168,100	1	EI Cell 1/Cell 2/Cell 3	pipeline	silt
Upper	Between Channel	84,200	1	EI Cell 1/Cell 2/Cell 3	pipeline	silt
Upper	Fourth East Jetty	19,600	2	EI Cell 1/Cell 2/Cell 3	pipeline	silt
Upper	Upper Brunswick	17,100	2	EI Cell 1/Cell 2	pipeline	silt
Upper	Lower Brunswick	29,800	2	EI Cell 1/Cell 2	pipeline	silt
Mid River	Upper Big Island	22,500	2	ODMDS/DA-10	B&B or Hopper, Pipe.	sandy silt
Mid River	Lower Big Island	35,900	2	ODMDS/DA-10	B&B or Hopper, Pipe.	sandy silt
Mid River	Keg Island	34,100	2	ODMDS/DA-10	B&B or Hopper, Pipe.	sandy silt
Mid River	Upper Lilliput	48,900	2	ODMDS/DA-10	B&B or Hopper, Pipe.	sandy silt
Mid River	Lower Lilliput	43,000	2	ODMDS/DA-10	B&B or Hopper, Pipe.	sandy silt
Mid River	Upper Midnight	107,000	2	ODMDS/DA-8	B&B or Hopper, Pipe.	sandy silt
Mid River	Lower Midnight	25,500	2	ODMDS/DA-8	B&B or Hopper, Pipe.	sandy silt
Mid River	Reaves Point	21,200	2	ODMDS/DA-8	B&B or Hopper, Pipe.	silty sand
Mid River	Horseshoe Shoal	45,900	2	Bird Island/DA-3/4	pipeline	sand
Mid River	Snows Marsh	21,800	2	Bird Island/DA-3/4	pipeline	sand
Mid River	Lower Swash	12,000	2	ODMDS/DA-3/4	B&B or Hopper, Pipe.	sand
Inner OB	Battery Island	25,300	4	ODMDS/DA-3/4	B&B or Hopper, Pipe.	sand
Inner OB	Southport	0	4	ODMDS/DA-3/4	B&B or Hopper, Pipe.	sand
Inner OB	Baldhead-Caswell	11,000	4	ODMDS/DA-3/4	B&B or Hopper, Pipe.	sand
Inner OB	Smith Island	257,800	2	BHI/CB/WOI beaches	Pipeline	sand
Inner OB	Ocean Bar Entrance Channel	545,000	2	BHI/CB/WOI beaches	Pipeline	sand & silt
Outer OB	Ocean Bar Outer Channels	538,000	1	ODMDS	Hopper	silt
	TOTAL	3,211,000				

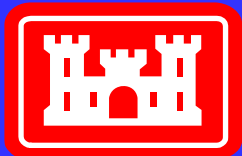
EI = Eagle Island, ODMDS = Ocean Dredged Material Disposal, BHI=Bald Head Island,CB=Caswell Beach,WOI=West Oak Island, B & B = Bucket and Barge

Existing Conditions



- ✓ New ODMDS
- ✓ Mgmt Plan for Eagle Island (& other islands)
- ✓ Shoaling Study (Coastal)
- ✓ Sand Management Plan

**WILMINGTON HARBOR
DMMP**

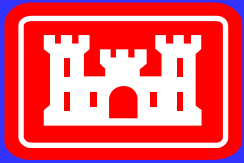


All Alternatives Considered



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Item #	Wilmington Harbor DMMP Alternatives
1	Management Plan for Eagle Island, cell rotation / dike raises
2	Capacity restoration of existing CDFs by ocean disposal/beneficial use
3	Sand recycling at Islands 3 and 4
4	Disposal of all Beach Compatible Material on Beach
5	New ODMDS
6	Create a nearshore disposal site for recycling sand to the beach
7	Use of scow or barge overflow to increase dredging efficiency
8	New CDF at U. S. Coast Guard LORAN site
9	Open water site mid-harbor near Snows Cut (100-200 acres)
10	Sand recycling from borrow hole in the channel near Horseshoe Shoal
11	CDF at Progress Energy's Brunswick Nuclear Plant (Southport)
12	New Eagle Island type CDF in MOTSU buffer area at Carolina Beach
13	New confined disposal facility on Eagle Island by expansion north
14	Restoration of Islands 8 and 10



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Alternatives Eliminated

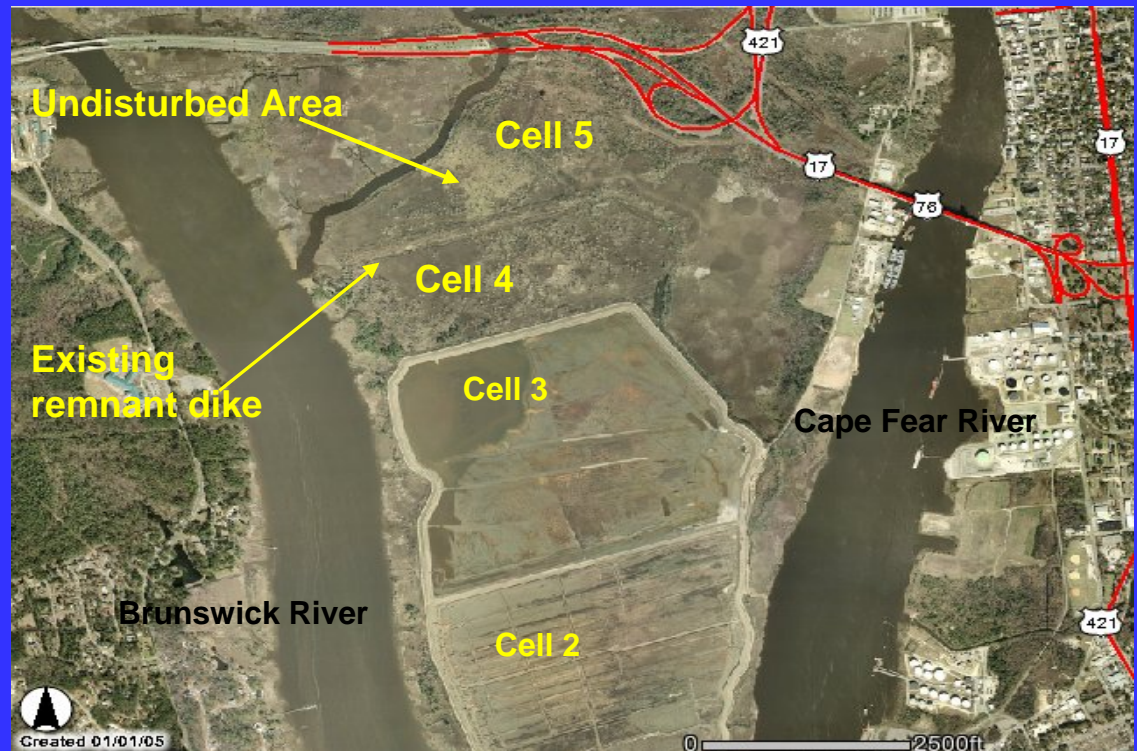
Eagle Island Expansion

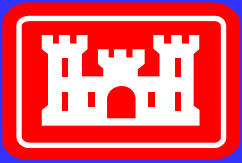


- Expansion north into Cell 4 (120 ac.) and/or Cell 5 (55 ac.)
 - use as typical CDF
 - use as stockpile area for dried material from Cells 1-3

Issues

- 1- Size (SETTLE model)
- 2 - Mitigation Costs
 - ~14\$M each cell





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Alternatives Eliminated

Eagle Island Dike Raises

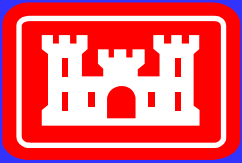


- Raise Dikes to 52 feet and 62 feet
- Also evaluated: stone columns, wick drains, and underdrains

Issues

- 1- Slope Stability Analysis
- 2 – Construction Costs





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Alternatives Eliminated

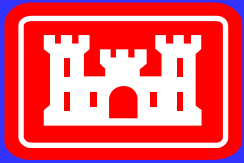


CDF at the **Coast Guard Loran Station** on River Road

Issues

- 1-Timing of decommissioning
- 2-Support for a park by local municipalities
- 3-Opposition by adjacent property owners
- 4-Natural Heritage Area
- 5-Groundwater/drinking water





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Alternatives Eliminated

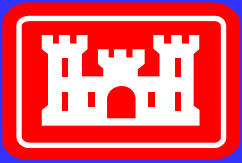


Open water disposal site near Snows Cut (~150 acres)

Issues

- 1-Mitigation Costs
(~\$39,000,000)
- 2-Major opposition by
resource agencies
- 3-Location for mitigation site





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Alternatives Eliminated

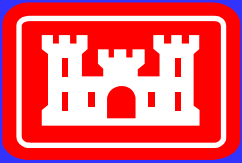


Borrow Hole/Sediment Trap at Horseshoe Shoal

Issues

- 1-Questionable benefits
- 2-Environmental Impacts
- 3-No advanced maintenance authority





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Alternatives Eliminated



Disposal sites at CP&L's **Brunswick Nuclear Plant (BNP)**

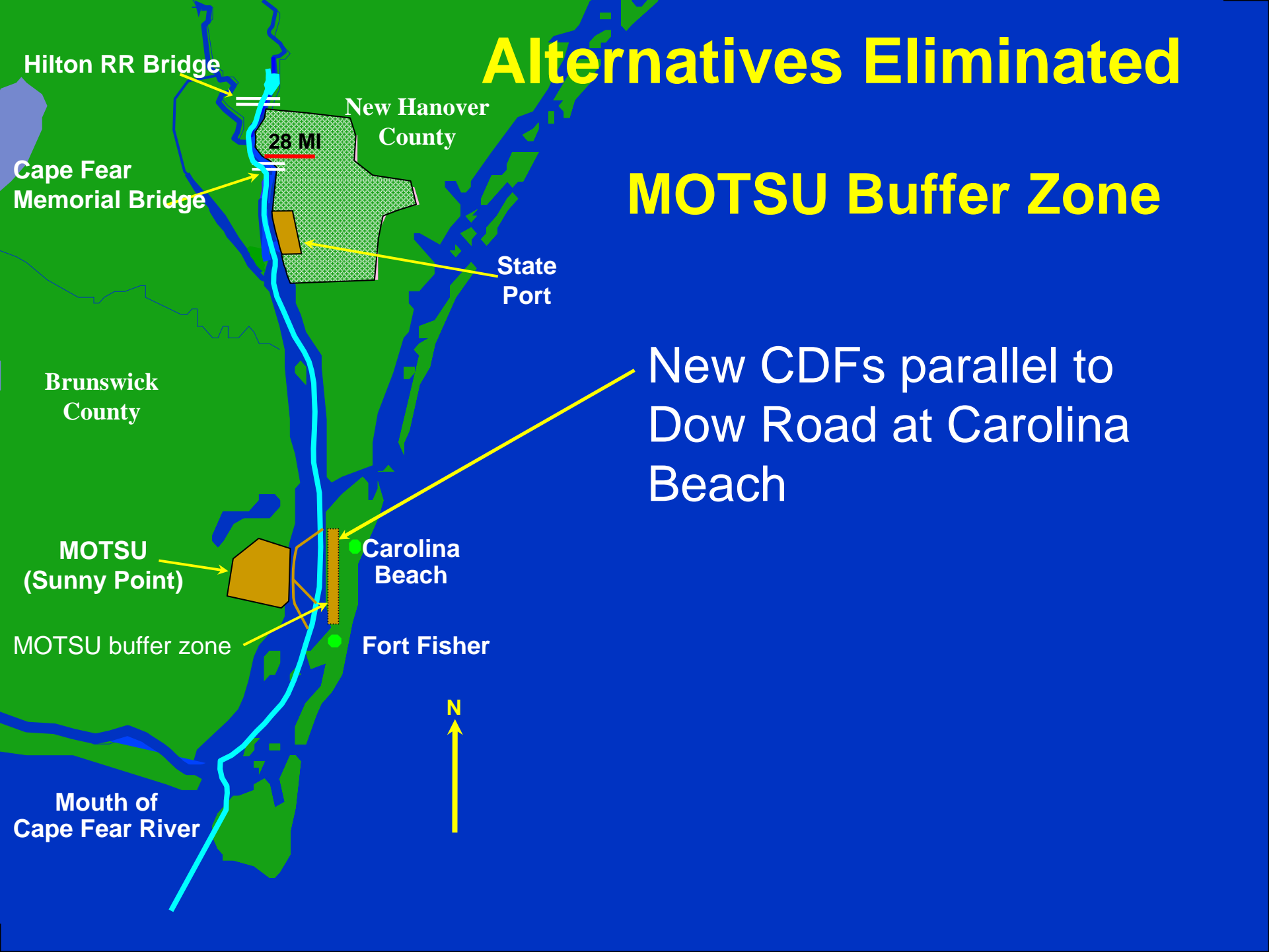
Issues

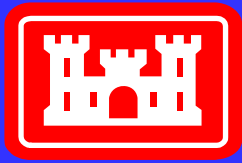
- 1-Landuse Plan by Ownership
- 2-Proximity to proposed NCIP
- 3-Location of BNP



Alternatives Eliminated

MOTSU Buffer Zone





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Alternatives Eliminated

MOTSU buffer zone

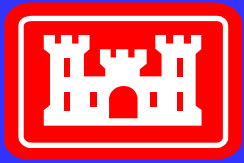


- Eagle-Island type CDFs w/ multiple cells
- Sand in buffer area to be pumped to beach prior to building CDFs
 - Sediment compatibility analysis
 - Groundwater study

Issues

- 1-Groundwater
- 2-Social
- 3-Economics





Alternatives Eliminated



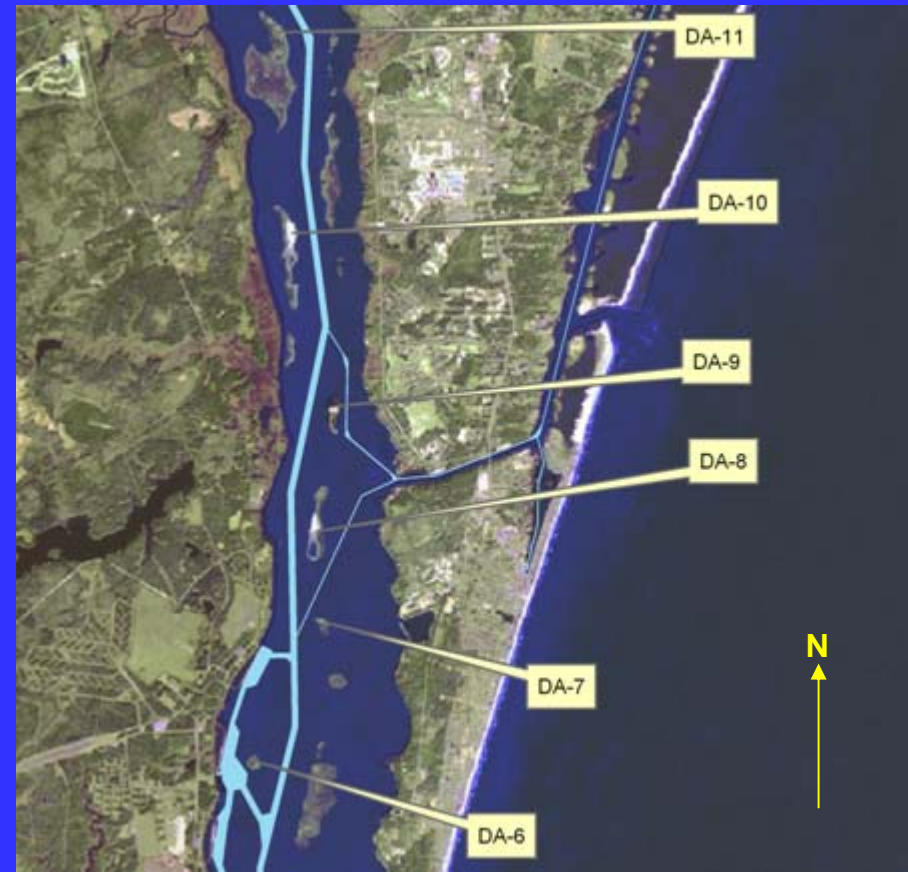
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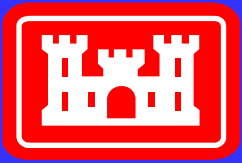
Restoration/Rehab of Islands 8 & 10

- Restore original footprint on channel side
- Restore capacity at existing sites by ocean disposal and/or beneficial use
- Create ecosystem restoration feature (rock sill)

Issues

- 1-Construction cost
- 2-Mitigation
- 3-Economics





Remaining Alternatives

Eagle Island

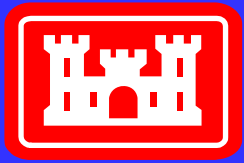


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- Cell rotation (update management plan), ditching, drying & dike raising
- Geotech analysis to determine dike heights
 - Current limit is 40'+2' overbuild
- Increase capacity: beneficial use or dry material to ODMDS



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Wilmington District

Remaining Alternatives

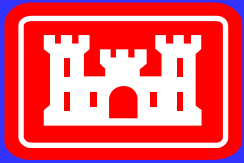
Sand Recycling



- **Systematic sand recycling at Islands 3 & 4**
 - DA-4 – primary sand recycling island
 - DA-3 – disposal of material from DA-4 access channel
 - DA-4 material pumped to Kure Beach in 2002

(Carolina Beach & Vicinity South Flood & Coastal Storm Damage Reduction)





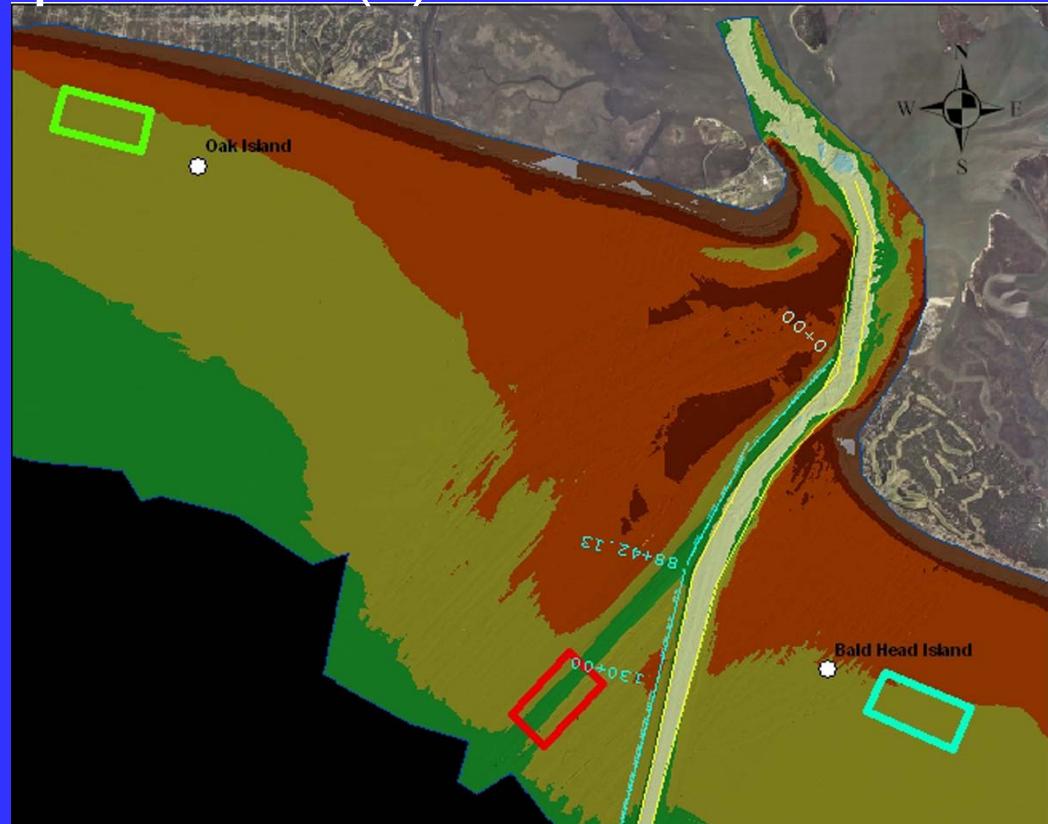
Wilmington District

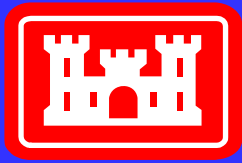
Remaining Alternatives



Nearshore Disposal

- Establish nearshore disposal site(s)
 - Caswell Beach
 - Jay Bird Shoal
 - Bald Head Island
- Disposal sites in water depths 30'-40' for sand recycling to beaches
 - Temporary sand placement areas (avoid permanent disposal of sand)
 - Small to large quantities of sand





Remaining Alternatives



Wilmington District

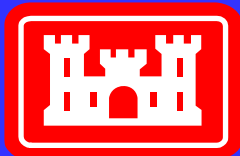
Beneficial Use

- **Bird Islands (Ferry Slip and Pelican Island)**
 - Least cost disposal method for adjacent reaches
 - Last renourished in 2004 with 167,000 cu. yds. of material
 - In coordination with the National Audubon Society
- **Beach Disposal (Inner Ocean Bar)**
 - 2000 Sand Management Plan
 - 6-yr. cycle for beach disposal
- **Eagle Island Dry Dredged Material**
 - continuing to pursue beneficial uses/users
 - additional sediment testing



Courtesy Bill Adams





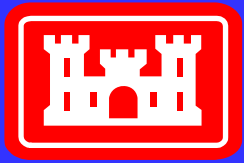
Environmental Considerations



Wilmington District

- O&M of Wilmington Harbor covered under existing NEPA documents
 - FEIS, Long-Term Maintenance of Wilmington Harbor, NC, 1989
 - Final Feasibility Report EIS on Improvement of Navigation, Cape Fear - Northeast Cape Fear Rivers Comprehensive Study, Wilmington, NC, 1996.
 - EA Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, NC, 2000.
- DMMP Process
 - Scoping meeting and letter in 2005
 - Notice of Intent to prepare EIS in 2006
 - EIS or EA, as required
 - Resource agencies and stakeholders are on PDT





Wilmington District

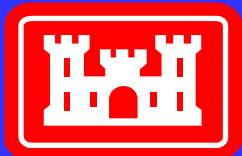
Environmental Considerations



“New” Environmental Impacts

- Related to proposed Nearshore Placement Sites
- Avoidance and Minimization:
 - EFH, including hardbottoms & other aquatic resources
 - Cultural Resources
 - Mitigation only if impacts cannot be avoided or sufficiently minimized
- Continue to coordinate with appropriate agencies:
 - NCDWR - NCWRC - SHPO
 - NMFS - NCDWQ
 - NCDMF - USFWS





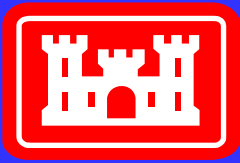
Wilmington District

Economic Summary

Eagle Island Alternatives



Comparison of Eagle Island (EI) Alternatives	
	Total Avg. An. Equiv. Costs
EI with Cell 4 (\$14 million mitigation)	\$13,189,948
EI with Cell 4 (\$4 million mitigation)	\$12,281,503
EI to 2014 then ODMDS	\$9,539,426
Pump to EI (w/o Cell 4) then take dry material by scow to ODMDS	\$11,485,825
Mechanical direct to ODMDS from 2011 (channels that normally go to EI)	\$11,070,756

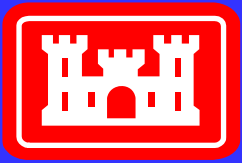


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Economic Summary



<u>Location</u>	<u>Average Annual Costs</u>
Upper River to the ODMDS (currently goes to Eagle Island)	\$9,539,426
Mid-River to the ODMDS	\$2,358,023
Disposal (sand recycling) at Islands 3 and 4	\$706,715
Inner Ocean Bar Sand to Beaches	\$6,752,063
Outer Ocean Bar to ODMDS	\$3,458,000
Totals	\$22,814,228



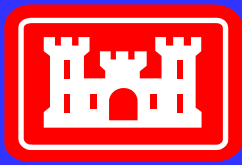
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Summary of Recommended Plan



- Eagle Island
 - Continue to pursue beneficial uses
- Sand Recycling at DA-3 and DA-4
- Bird Islands
- Beaches
- Nearshore Placement Sites
- ODMDS





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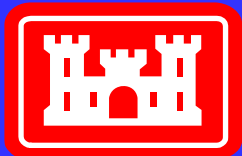
Policy Issues

Beach Disposal



- **Federal Standard**—The least costly alternative, consistent with sound engineering practices and selected through the 404(b)(1) guidelines or ocean disposal criteria
- **Environmental Operating Principle #1**—Strive to achieve environmental sustainability: Environmentally sustainable solutions are achieved by linking environmental and economic needs.
- **Sound Engineering**
 - principled engineering procedures
 - state of the art techniques and approaches
 - provide the best engineering solution
 - balancing economics and the environment
- **Engineering Codes of Ethics**
 - NSPE (#III) “Engineers are encouraged to adhere to the principles of sustainable development in order to protect the environment for future generations”
 - ASCE (Fundamental Canon #1) “Engineers...shall strive to comply with the principles of sustainable development...”

Average Annual Costs (6-yr. cycle)	{	Beach Disposal (Inner OB)	\$6,752,063
		ODMDS (Inner OB)	\$6,581,535



Wilmington District

Policy Issues

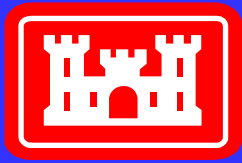
Eagle Island Earth Dike

Factor of Safety



- Unresolved ITR comment
- History
- Design Criteria
 - EM-1110-2-1902
 - EM-1110-2-5027
- Low Hazard – Low Risk
- Spencer vs. Corps Methods
- $FS < 1.5$





Wilmington District

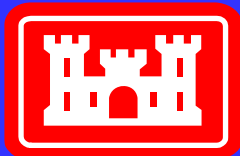
WILMINGTON HARBOR DMMP

Next Actions by PDT



- **Final shoaling study** – incorporate new #'s
- **Identify nearshore placement site locations**
- **Dike heights at Eagle Island**
 - Final determination on Eagle Island Cells 4/5
 - Beneficial uses (Eagle Island)
- **Survey of ODMDS (capacity)**





Wilmington District

WILMINGTON HARBOR DMMP Status/Schedule



Draft AFB Package Submitted for ITR	10 Sep 07
Completion of ITR	24 Sep 07
Incorporation of ITR comments	9 Oct 07
Submit AFB Package to SAD	15 Oct 07
Alternative Formulation Briefing	19 Nov 07
ITR of draft DMMP/EIS/EA	3 rd Q FY08
File Draft DMMP/EIS/EA with EPA for Public Review	3rd Q FY08
ITR of final DMMP/EIS/EA	4 th Q FY08
File Final DMMP/EIS/EA with EPA for Public Review	1st Q FY09
If EIS - Record of Decision Signed	April 09
MSC Approval Final DMMP/EIS	April 09
Implementation	FY11

A large flock of seagulls is captured in flight across a bright blue sky with scattered white clouds. The birds are seen from various angles, showing their white bodies and dark wingtips. Below the sky, a green grassy field with some taller reeds is visible, and in the far distance, a calm body of water stretches across the horizon. The overall scene is bright and airy, suggesting a coastal or marshy environment.

QUESTIONS?